CLAIMS:

1. An oral phototherapy applicator comprising

a body sized and shaped so as to fit at least partially in a user's mouth;

a plurality of bristles of elongate shape and having longitudinal axes, the bristles being coupled to the body and adapted to brush the user's teeth; and

at least one radiation emitter coupled to the body to irradiate with phototherapeutic radiation a portion of the oral cavity other than tissue in contact with the bristles.

2. The apparatus of claim 1 wherein the apparatus further comprises a plurality of radiation emitters that emit light in different directions.

3. The apparatus of claim 1 wherein the apparatus further comprises an emitter than irradiates both a region of tissue in contact with the bristles and a portion of the oral cavity that is not in contact with the apparatus.

4. The apparatus of claim 1 wherein the apparatus further comprises at least one emitter that irradiates tooth tissue in contact with the bristles and gum tissue surrounding the tooth tissue.

5. The apparatus of claim 1 wherein the emitter further comprises a source of radiation having wavelength components in at least two separate spectral bands.

6. The apparatus of claim 1 wherein the emitter further comprises at least two sources of radiation emitting different spectral bands of radiation.

7. The apparatus of claim 1 wherein apparatus further comprises at least one radiation source selected from the group of light-emitting diodes, superluminescent diodes, laser diodes, vertical cavity surface emitting lasers, fiber lasers, fluorescent solid-state sources, and lamps.

8. The apparatus of claim 1 wherein the apparatus further comprises a light diffuser optically coupled to the radiation emitting element to deliver diffuse radiation to the oral cavity.

9. The apparatus of claim 8 wherein diffuser comprises an optically transmissive element with a partially etched cladding.

10. The apparatus of claim 1 wherein the apparatus further comprises a plurality of optically transmissive bristles.

11. The apparatus of claim 10 wherein the bristles are optically coupled to a radiation emitting element.

12. The apparatus of claim 10 wherein the bristles are coupled to the emitter to receive and propagate radiation therefrom.

13. The apparatus of claim 10 wherein the bristles are at least partially coated with a reflective material.

14. The apparatus of claim 10 wherein the bristles have at least one shape selected from the group of conical, tapered, curved and spiral shapes.

15. The apparatus of claim 10 wherein the bristles are shaped to transmit radiation upon contact between the bristles and a portion of the oral cavity

16. The apparatus of claim 10 wherein the bristles further comprise one or more fluorescent, luminescent or lasing elements.

17. The apparatus of claim 10 wherein the bristles are incorporated into a brush head, which is removable and replaceable.

18. The apparatus of claim 10 wherein the bristles are optically transmissive and coupled to a radiation emitter to receive and transmit radiation.

19. The apparatus of claim 1 wherein the apparatus further comprises a plurality of bristles and at least a portion of radiation from the emitting element is emitted in a direction which is not parrellel to the bristles.

20. The apparatus of claim 19 wherein the light refractive characteristics of the optically transmissive bristles are selected to inhibit light transmission to the oral cavity in the absence of contact between the bristle and a surface of the teeth or cavity.

21. The apparatus of claim 1 wherein the apparatus further comprises a motion sensor and controller which controls the radiation emitter based on signals from the motion sensor.

22. The apparatus of claim 1 wherein the apparatus further comprises a contact sensor and controller which controls the radiation emitter based on signals from the contact sensor.

23. The apparatus of claim 1 wherein the apparatus further comprises an diagnostic sensor and controller which controls the radiation emitter based on signals from the diagnostic sensor.

24. The apparatus of claim 1 wherein the apparatus further comprises at least one thermally conductive element for extracting heat from the emitter.

25. The apparatus of claim 24 wherein the thermally conductive element comprises a fluid heat transfer medium.

26. The apparatus of claim 24 wherein the apparatus further comprises a handle that serves as a heat sink.

27. The apparatus of claim 24 wherein the thermally conductive element comprises a phase change material.

28. The apparatus of claim 24 wherein the apparatus further comprises a heat transfer element for heating a portion of the oral cavity with waste heat from the apparatus.

29. The apparatus of claim 1 wherein the apparatus is configured such that, upon disposition of the applicator within the mouth, radiation from the emitter can penetrate the muscosal lining of the oral cavity and deliver phototherapeutic energy to a region of facial tissue.

30. The apparatus of claim 1 wherein the apparatus is configured to direct radiation to at least one portion of the oral cavity selected from the group of a tooth, cheek, tongue, palate, throat and facial tissue, lymphatic tissue, blood, gland, follicle, collagen and pigmentation.

31. The apparatus of claim 1 wherein the apparatus further comprises an ultrasound generator for delivering acoustic energy to a target tissue site.

32. The apparatus of claim 1 wherein the apparatus further comprises a vibrating element for applying intermittent pressure to a target tissue site.

33. The apparatus of claim 1 wherein the apparatus further comprises a drug delivery port.

34. The apparatus of claim 1 wherein the apparatus further comprises an energy reflector for redirecting phototherapeutic radiation towards a target tissue site.